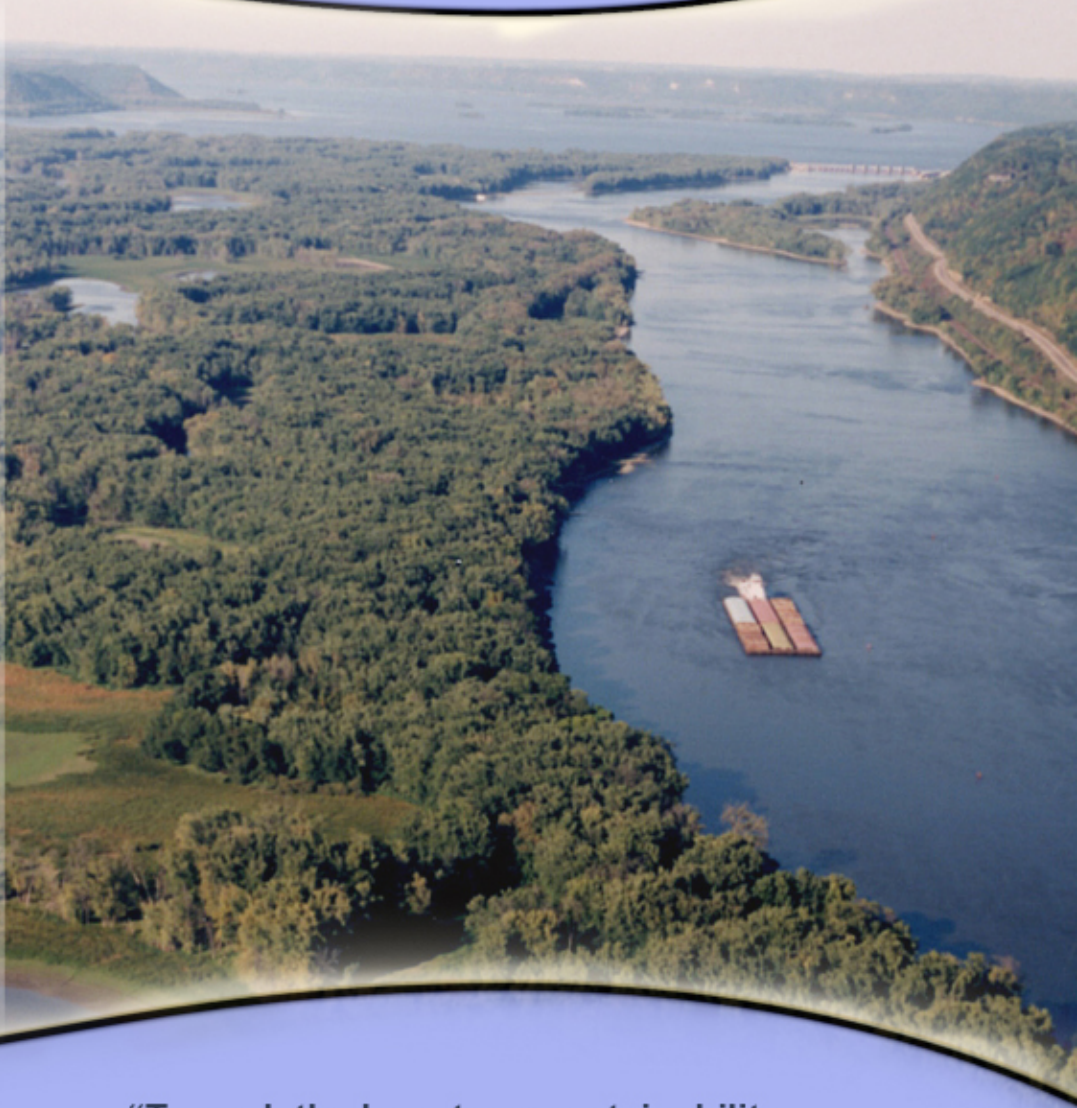


Integrated River Management for the Upper Mississippi River and Illinois Waterway System

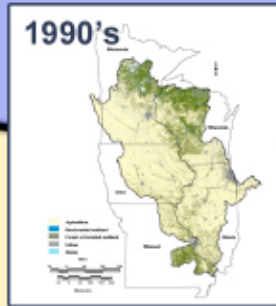
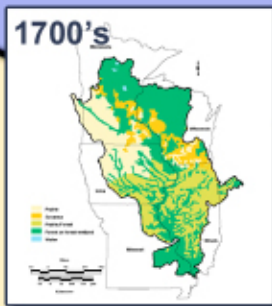
SUSTAINABILITY



“To seek the long-term sustainability
of the economic uses and ecological integrity
of the Upper Mississippi River System”

Ecosystem Problems

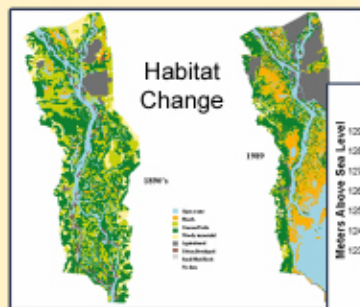
The principal ecosystem problem is habitat degradation and species declines. There are many causes of this condition: they are called "Cumulative Effects."



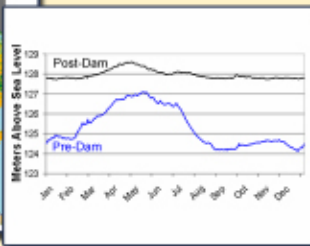
Watershed Development

The effects start at the watershed where prairie conversion to agriculture, logging, and urban development increased soil erosion and delivery rates. Land clearing, stream channelization, ditching, and field tiling also increased the rate of runoff, which had significant impacts on mainstem hydrologic patterns.

1890's 1990's



Impoundment



Impoundment to create the 9-Foot Channel Project changed the distribution of surface water and altered the natural hydrograph.

Some of the common symptoms of pool aging are loss of backwater depth caused by excessive sedimentation and wave induced island erosion. Other symptoms of pool aging include poor water clarity, loss of emergent and submersed aquatic plants, forest degradation, and an overall simplification of habitat characteristics.

Floodplain Development



Floodplain development caused the direct loss of habitat and altered hydrologic and sedimentation patterns.

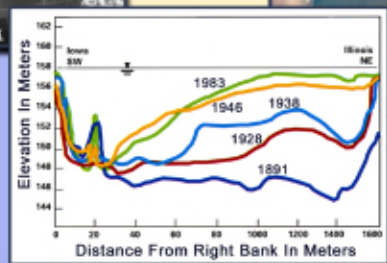
Pool Aging (Island Loss)

The expanded backwater habitats created by the dams were initially highly productive. Over time, however, these habitats have degraded through a process generically known as "pool aging."

1961

Island Loss

1994



Sedimentation

Navigation Problems

The principal navigation problem is the potential for significant traffic delays on the system which will result in economic losses to the region and nation. The existing 600 foot locks require a double lockage process to handle the 1,200 foot tows that use the river today.



Double Lockage (600')

The double-lockage is a time-consuming process in which the first nine barges in a 15-barge tow are pushed into the lock and uncoupled. The tow boat and other barges then back out of the way while the first "cut" locks through. After turning back the lock chamber, the second cut locks through. The entire process can take almost 2-hours, and the delay to waiting tows accumulates significantly as traffic increases.

Site	Utilization	Avg. Delay (hrs)
Lock 20	70%	2.9
Lock 21	73%	2.6
Lock 22	80%	4.5
Lock 24	76%	3.6
Lock 25	76%	4.5

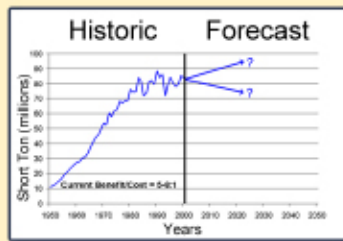
Utilization of Locks 20-25

Locks 20-25 have high average delays. Additional demand will increase delays significantly.



Delays

Future demand for waterway transportation is uncertain. Five scenarios were developed that reflect different global and domestic market conditions. Alternatives were formulated to minimize the risk of moving forward in an uncertain future.



Future Demand



Safety & Reliability



Safety is always a concern around heavy equipment and water, especially in bad weather and at night. Each time a tow must be uncoupled and remade increases the risk.

Reliability is another important factor to ensure efficient system operation. An outage at a single lock site can delay the entire system.

Ecosystem Restoration Alternative

1998



2002



Floodplain Restoration

	15-Year Plan	Full Implementation Plan
	Number of Projects	Number of Projects
Ecosystem Management and Restoration Measures		
Island Building	23	91
Fish Passage	4	14
Floodplain Restoration	24	72
Water Level Management	15	15
Backwater Restoration	38	215
Side Channel Restoration	29	147
Wing Dam/Dike Alteration	19	64
Shoreline Protection	73	392
Total Number of Projects	225	1010

The preferred ecosystem restoration alternative is to seek approval of a \$5.3 billion framework consisting of structural measures along with important operational changes shown in the table above. This alternative will be implemented through an adaptive approach that includes Congressional and Administration oversight. The plan will seek authorization for the first 15 years (\$1.46 billion) for measures that provide the best return on investment, best gains in diversity, and additional knowledge required to guide future investments. Biological monitoring will document benefits and improve future design.

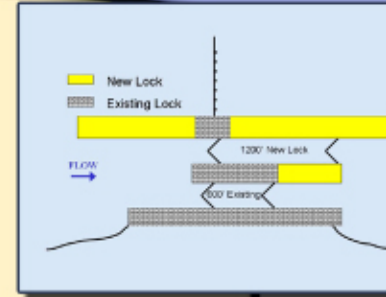


Fish Passage

The Preferred Plan

The Preferred Plan proposes an integrated framework for modifications and operational changes to the Upper Mississippi River and Illinois Waterway System to provide for navigation efficiency and environmental sustainability, and to add ecosystem restoration as an authorized project purpose.

Navigation Efficiency Alternative



New Locks

x = Initial Authorization
o = Additional Authorization Required

The preferred navigation efficiency alternative is to seek approval of a

\$2.4 billion framework consisting of structural and non-structural measures as shown in the adjacent table. This alternative will be implemented through an adaptive approach that includes additional Congressional and Administration oversight. This plan will only seek initial authorization for the following:

- Mooring Facilities at L/D 12, 14, 18, 20, 22, 24, and La Grange (\$11 million)
- Switchboats at L/D 20-25 (\$207 million operating costs)
- Seven new 1200' locks at L/D 20-25 (\$1.46 billion)
- Mitigation for site-specific and system environmental effects (\$200 million)
- Continued study and monitoring of the system to provide information for re-evaluation at key decision points.

	Mooring Facilities	Switchboats	1,200-ft locks	Lock extensions
L/D 11		o		
L/D 12	x	o		
L/D 13		o		
L/D 14	x			o
L/D 15				o
L/D 16				o
L/D 17				o
L/D 18	x			o
L/D 19				
L/D 20	x	x	x	
L/D 21	x	x	x	
L/D 22	x	x	x	
L/D 23	x	x	x	
L/D 24	x	x	x	
L/D 25	x	x	x	
La Grange	x		x	
Proton			x	



Side Channel Restoration



Switchboat

Dual Purpose Operation



Dredging & Island Building



Dike Alteration / Island Protection



Water Level Management



Mooring Cells

Ecosystem Restoration Benefits

Implementation of the ecosystem restoration and management plan is estimated to improve over 400,000 acres of floodplain and river habitat and improve fish access to 2,500 miles of main stem and tributary river channels. By replicating natural processes the energy of the river will help regain the mosaic of habitats enjoyed by people along the Upper Mississippi River System for over 10,000 years.

The 11 million recreational visitors per year will witness a restored, diverse, and healthy ecosystem.



2000



Island Building

1994

Restoration of a single Island complex improves 1,000 acres of habitat providing an immediate establishment of aquatic plants and improved water quality, fish habitat and terrestrial habitat for birds and other animals.

East St. Louis 1200 AD



Information on over 10,000 years of man's relationship to the river is preserved in the thousands of archeological sites along the river.

	Initial Implementation Plan Acres of Benefit	Full Implementation Plan Acres of Benefit
Ecosystem Management and Restoration Measures		
Island Building	23,000	91,000
Floodplain Restoration	46,056	118,756
Water Level Management	28,200	28,200
Backwater Restoration	24,800	124,800
Side Channel Restoration	2,900	14,700
Wing Dam/Dike Alteration	190	640
Shoreline Protection	8,040	38,385
Total Area of Benefits (Acres)	133,186	416,481
	River Mile	River Mile
Fish Passage	940	2590

Acres of Benefits



Backwater
Marsh

Backwater marsh restoration on the Illinois River can result in a dramatic increases in waterfowl usage while also benefiting shorebirds and fish.

Backwater
Restoration



Backwater deepening and aeration provides winter fish habitat and improved angler success and recreational opportunities.

Navigation Efficiency Benefits

The shipment of commodities on the system has national and regional economic implications.

A Diversity of Commodities

The system carried 50% of the nations corn exports and 40% of the soybean exports in 2002. The system also transports coal to power plants and material for many industries.



International Port at New Orleans



The transportation system of the United States is a multi-modal system that requires the efficient interaction between rail, truck, air and waterway modes of transport. The economy of the country and its competitiveness in world markets depends on a safe, reliable, and efficient national transportation system.

The navigation efficiency improvements outlined in the preferred plan will save almost one hour per lockage at new locks. This, and other time saving measures, will reduce transportation costs which translates to National Economic Development benefits.

Longer Locks Limit Uncoupling of Barges



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